

CLAIMS

[1] A fluorescent lamp comprising a glass bulb provided with a phosphor film on its internal face, in which a rare gas and an amalgam pellet are enclosed, wherein

5 the amalgam pellet contains zinc, tin, and mercury, one or a plurality of the amalgam pellets are enclosed in the glass bulb, and each of the amalgam pellets has a weight of not more than 20 mg, and

the fluorescent lamp satisfies the relationship expressed as:

$$45 \times (1-A) \leq x \leq 55 \times (1-A),$$

10 $75A \leq y \leq 85A,$

$$45-30A \leq z \leq 55-30A, \text{ and}$$

$$x+y+z \leq 100,$$

where A represents a value whose lower limit is determined as:

$$A \geq 0.3-(S/25) \text{ and } A \geq 0.1 \text{ when } 0 < L^2/D \leq 1.5 \times 10^4,$$

15 $A \geq 0.4-(S/25) \text{ and } A \geq 0.2 \text{ when } 1.5 \times 10^4 < L^2/D \leq 5 \times 10^4, \text{ or}$

$$A \geq 0.5-(S/25) \text{ and } A \geq 0.3 \text{ when } 5 \times 10^4 < L^2/D \leq 8.5 \times 10^4,$$

where D represents an internal diameter of the glass bulb in millimeters,

L represents a length of a discharge path in millimeters,

S represents a surface area of the amalgam pellet in square

20 millimeters,

x represents a content of zinc in percent by weight,

y represents a content of tin in percent by weight, and

z represents a content of mercury in percent by weight.

25 [2] The fluorescent lamp according to claim 1, wherein a plurality of the amalgam pellets are enclosed in the glass bulb, and each of the amalgam pellets has a weight of not more than 15 mg.

[3] The fluorescent lamp according to claim 1 or 2, wherein the value of A satisfies $A < 0.9$.

[4] The fluorescent lamp according to claim 1 or 2, wherein the amalgam
5 pellet is in an approximately spherical shape and has an average spherical diameter of not less than 0.3 mm and less than 3.0 mm.

[5] The fluorescent lamp according to any one of claims 1 to 4, wherein the amalgam pellet is made of $Zn_aSn_bHg_c$, where a, b, and c are values in
10 percent by weight satisfying $10 \leq a \leq 30$, $30 \leq b \leq 65$, and $25 \leq c \leq 45$.

[6] The fluorescent lamp according to any one of claims 1 to 5, wherein the amalgam pellet releases mercury at least at 260°C.

15 [7] The fluorescent lamp according to any one of claims 1 to 6, wherein the amalgam pellet further contains less than 10 percent by weight of at least one element selected from bismuth, lead, indium, cadmium, strontium, calcium, and barium.

20 [8] The fluorescent lamp according to any one of claims 1 to 7, wherein the amalgam pellet is made of a mixture of $ZnHg$ and $SnHg$.

[9] An illumination device comprising the fluorescent lamp according to any one of claims 1 to 8.

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[10] A method for manufacturing the fluorescent lamp according to any one of claims 1 to 8, the method comprising the steps of:
forming the phosphor film on the internal face of the glass bulb; and

enclosing the amalgam pellet in the glass bulb,
wherein in the amalgam enclosing step, the glass bulb is kept at a
temperature of not lower than 260°C.